bel canto

e.One™ series

REF150s

USER'S GUIDE

REF150s

DUAL MONO AUDIO POWER AMPLIFIER

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Important Safety Instructions

Explanation of symbols used in this manual or on the rear/underside of the apparatus:

The Lightning Flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product enclosure that may be of sufficient magnitude to constitute a risk of shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

TO COMPLETELY DISCONNECT THIS APPARATUS FROM THE AC MAINS, DISCONNECT THE POWER SUPPLY CORD PLUG FROM THE AC RECEPTACLE.

THE MAINS PLUG OF THE POWER SUPPLY CORD SHALL REMAIN READILY ACCESSIBLE.

Disconnect supply cord before changing fuse.
Refer servicing to qualified service personnel.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE AND OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHOULD NOT BE PLACED ON THIS APPARATUS.

- Read, keep and follow these instructions.
- Heed all warnings.
- Do not use the apparatus near water, ie near a bathtub, kitchen sink, laundry tub, in a wet basement, near a swimming pool etc.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the Manufacturer's instructions. Site the apparatus so that its location or position does not interfere with its proper ventilation. For example, the apparatus should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings, or placed in a built in installation such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.
- Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet; consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and at the point where they exit from the apparatus.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug has been damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- Mains plug: Use the mains plug to disconnect the apparatus from the mains supply. The mains plug must be accessible at all times. Use the mains switch (if applicable) when the apparatus is not in use.
- Objects and liquid entry: Do not let objects or liquids fall into the apparatus. Do not expose the apparatus to dripping or splashing. Do not place a vessel containing liquid on top of the apparatus.
- No naked flame sources, such as lighted candles, should be placed on the apparatus.
- The apparatus has been designed for use in moderate and tropical climates

In The U.K.

Fuse replacement:

This appliance is fitted with a non-rewireable 10 amp mains plug. The plug contains a 10 amp fuse. If the fuse has blown it can be replaced as follows:
a) Pull out the black fuse cover/carrier.
b) Remove and dispose of the blown fuse.
c) Fit a new 10 amp BS1362 approved fuse into the carrier and push the carrier back into the plug.

Always ensure the fuse cover is fitted. If the fuse cover is missing do not use the plug. Contact your Bel Canto retailer to obtain a replacement fuse cover. Fuses are for fire protection and do not protect against electric shock.

WARNING: THIS APPLIANCE MUST BE GROUNDED.

FCC NOTICE

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Green By Design

All Bel Canto products make use of compact and efficient design principles. Our products use less resources per unit to produce better performance than ever before. Everything from reduced packaging volume, to less weight in transport helps to reduce the overall environmental impact of bringing our products into the market.

Our products make very efficient use of electricity. Low energy usage and compact size ensure that the physical and environmental footprints of all Bel Canto products are minimized. Quality and performance play into this approach as all of our products are designed to remain vital and valid performers for many years. Should you want to upgrade to one of our new products, we even offer trade-in value for your old Bel Canto product to ensure that it is recycled in the most efficient and responsible manner.

RoHS and WEEE

All of our current products are designed and produced to RoHS standards, ensuring that dangerous materials do not enter the waste stream. Lead free electronics assemblies and environmentally safe finishing and production methods are utilized to ensure that our products and processes are environmentally safe.

Bel Canto Recycles

Bel Canto has always been a forward thinking company. In the same way that we are focused on the development of high-end audio products, we are also conscious of what we leave behind. For many years we have implemented environmentally sound measures to make the most efficient use of resources and keep our impact at a minimum.

We reuse or recycle more than 99% of the packing materials for our incoming parts shipments. Each year we divert massive amounts of cardboard, paper, plastic film, and Styrofoam from landfills. Our plastic and Styrofoam is delivered directly to local facilities that process it on site for use in their manufacturing. Steel, aluminum, and other metal waste products are delivered to local metal scrap yards for recycling back into the production stream.

We also participate in Waste Management's e-Cycling program. All electronic waste is processed in the US, with hazardous material being separated from non-hazardous, at ISO 9001 and ISO 14001 certified regional processing centers.

Our commitment to responsible production processes ensures that the absolute minimum of material used in the making of our products enters the waste stream.

Warranty Information

Bel Canto products are automatically covered by a 90 day factory warranty that covers all internal parts and labor. Register online (http://www.belcantodesign.com/Belcanto_Warranty.html) within 30 days of purchase from an authorized dealer to automatically extend your warranty for 2 years starting from the date of purchase. If you do not have web access, please contact your dealer for assistance. Upon fully completing registration, within 5 business days you will receive an email that officially validates your warranty. Your information will be used for internal use only and will not be sold or released outside Bel Canto. Your comments and suggestions are appreciated and help us continually improve our products and services.

The warranty is only valid to the original owner and is non-transferable. Damage caused by unauthorized modification, abuse, or neglect of product will void your warranty. Any cost associated with return of product is the sole responsibility of the owner. All returns require a return authorization number issued after completing the RMA form in the support section of our website. If you have any questions, please feel free to contact us online at info@belcantodesign.com.

Unpacking Your REF150s

REF150S packaging contains the following:

1 (one) – REF150S Amplifier
1 (one) – REF150S User's Guide
1 (one) – Power cord [6.6' – 2 meters long]

Carefully unpack each piece and check for shipping damage. If there is any damage, or if anything is missing, please contact your dealer, distributor or Bel Canto Design.

IMPORTANT!
Save all packing materials! They are custom designed to protect the unit during transportation or shipping. If the packing becomes lost or damaged, please contact your dealer or Bel Canto before attempting to transport your unit.

Power Connection

The power supply on the REF150S is preset for the proper power voltage. The power cable should have the correct plug for your local power system. If you believe this to not be true, please contact your dealer immediately.

This product, like any electrical component, can be dangerous and cause injury unless correct handling procedures are observed and used. Before powering this product, it is necessary to read and follow proper setup and procedures.

WARNING!
Do not connect power to this product yet!

Setup & Placement

Because the REF150S runs cool, it can be placed in many system locations without compromise. We do not recommend placing weights or other objects directly on the REF150S. This may scratch or mar the chassis finish. Do not use harsh chemicals when cleaning the outside of your REF150S.

Single Ended RCA and Balanced XLR connectors are available. XLR jacks allow balanced hookup using the standard North American pin configuration:

Pin 1 Ground
Pin 2 Signal +
Pin 3 Signal -

IMPORTANT!
Make all connections before powering your unit!

Design Features

The e.One REF150S amplifier is a dual-mono audio power amplifier that delivers 150 watts into 4 ohm loads per channel. Each amplifier contains its own dedicated regulated power supply for all amplifier stages, including the output section. This is achieved in a compact and elegant product through our adaptation of the latest analog switching amplifier and power supply technology from the ICEpower group.

Bel Canto's new generation of e.One analog switching audio power amplifiers extend our leadership in this technology. These amplifiers incorporate performance enhancing technologies that bring musicality and performance to new levels.

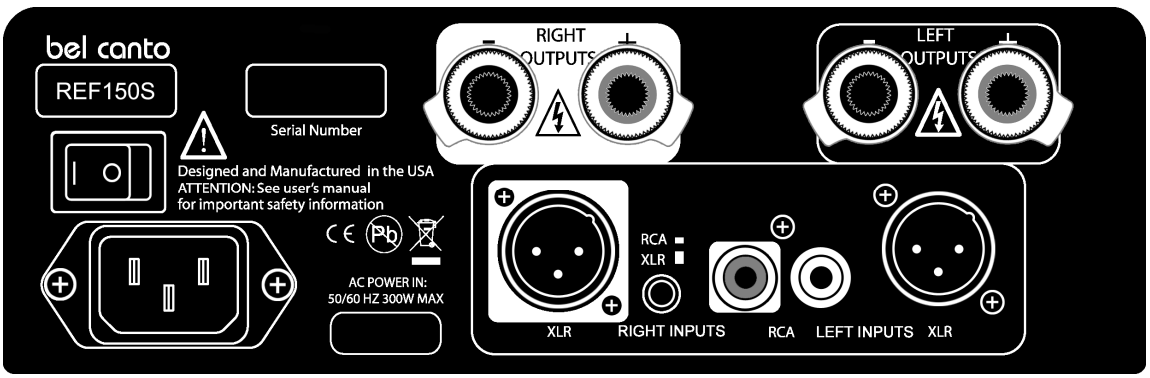
REF150S Features:

- The REF150S amplifier incorporates performance enhancing technology resulting from our on-going research in analog switching amplifier technology.
- High common mode rejection, wide dynamic range custom input stages are added. This input stage improved the drive to the amplifier, resulting in lower noise and distortion and wider dynamic range in real-world operation.
- The input stage uses the latest advanced amplifiers and passive components including: Audio grade metal film resistors, Solid Electrolytic ultra-low ESR decoupling capacitors and low noise regulated power supplies. These devices ensure that the input section is utterly transparent.
- The REF150S also uses our low noise power rectification and filter stage-further reducing noise and increasing energy storage and power supply quality-delivering more apparent power, enhanced resolution and sonic refinement.
- The REF150S uses 3rd generation switching amplifiers for lower High Frequency distortion, increased clarity and better high frequency extension.
- All Bel Canto e.One amplifiers are gain matched for easy mixing in system building, multi-channel and vertical bi-amplification applications.

CONDITIONING

The sonic performance of the REF150S will start to stabilize after approximately forty (40) hours of continuous power up. We recommend that the REF150S remains powered for optimal performance.

Rear Panel Connections



Never Connect Either the Positive or Negative Speaker Output to Any Ground Contact! Use Class 2 Wiring for all Loudspeaker Connections!

Connecting any Speaker Output on the REF150S to Ground will cause the amplifier to go into protection and could damage the amplifier and void the warranty.

- Power Switch: Power is on when the switch is toggled to the I position and off in the O position.
- IEC power cord jack: Connect a heavy gauge power cord from this jack to the wall power supply. Note the power setting indicated on the back of the amplifier before connecting the power.)
- Output Connections: WBT nextgen 5-way binding posts
- Input Connections and RCA/XLR switch: When using RCA cables for the input ensure that the RCA/XLR switch is pressed in to the RCA position. When using XLR cables insure that the switch is out in the XLR position. **Do not connect both XLR and RCA cables to the inputs!**

Double-check all connections to and from the amplifier. Power on the preamplifier in your system, activate its Mute setting and then power on the REF150S.

Tips For Operation

- In case there is hum or ground noise, check that the RCA/XLR switch is in the correct position for the type of connection being used.

- Ensure that the preamplifier or any source components are not producing hum by setting the preamplifier to a MUTE or Standby setting.

- The design of the REF150S reduces the chance for ground loop induced hum, but we still recommend using shorter interconnect cables to the preamplifier. Connect all power cables to a common outlet box or power conditioner unit to reduce the possibility for ground current noise being induced into the audio signal path.

- If you choose to power your source and preamplifier components from a different AC supply than used for the REF150S amplifiers, we recommend that you use a high quality balanced XLR cable driven from a true balanced XLR preamplifier output.

- **We do not recommend** that you resort to 'cheater plugs' or some other means to disconnect the power ground from the REF150S as this may lead to dangerous operation and void the warranty.

- The small blue LED lamp indicates that power is connected to the REF150S and that the power switch is in the ON position. If the amplifier detects a fault or short circuit in the output connections, it will go into a protection mode and stop playing. If this occurs toggle the power switch to the OFF position and check the speaker cabling to ensure that no speaker output is either shorted together or connected to a ground. When you are certain that the loudspeaker cabling is correct, power the unit ON again, check that the blue LED is lit and that music will play.

- There is an internal fuse protection on the REF150S. If the power switch is in the ON position, the power cable is connected to a functioning power outlet at the correct voltage and the blue LED is not lit, this indicates that the internal fuse may have blown. If this occurs contact your dealer, distributor or Bel Canto for service. There are no user replaceable fuses or other parts. Opening the chassis will void your warranty.

Specifications

Maximum Power Output:	150W 4 ohms, 75W 8 ohms per channel
Power Output 1% THD:	120W 4 ohms, 60W 8 ohms per channel
Minimum Load:	3 ohms per channel
Peak Output Current:	30 amperes
Frequency Response:	+/-3 dB 1.5Hz-90KHz, 4 ohm load
THD+N:	0.003% 1W, 1KHz, 4 ohms
IMD (CCIF):	0.0003%, 1W, 14:15KHz, 4 ohms
Output noise:	35uVRMS A-weighted 10Hz-20KHz
Voltage gain:	27dB (single ended or balanced input)
Damping factor:	>1000
Output Impedance at 100Hz:	<8 milliohms
Dynamic Range:	117dB
Input Voltage for Max Output:	1.1Vrms
Input connections:	Single-ended RCA or balanced XLR
RCA input impedance:	100Kohms
Balanced input impedance:	200Kohms
Output connections:	2-sets of WBT nextgen 5-way binding posts
Power On usage:	9.5W
Power Off usage:	0.0W
Internally Set Operating Voltages:	100-120VAC or 230-240VAC 50/60 Hz
Size:	8.5 x 3.5 x 12[inches], 216 x 88 x 305[mm] (WxHxD)

Weight: 13lbs, 6.5Kg

Features and specifications are subject to improvements and changes without prior notice.

Declaration Of Conformity

Application of Council Directive(s):
2004/108/EC and 2006/95/EC, as amended

Standard(s) to Which Conformity Is Declared:
EN 55013:2001 + A1:2003 + A2:2006
EN 55020:2007
EN 61000-3-2:2006
EN 61000-3-3:1995 + A1:2001 + A2:2005
EN 60065:2002/A12:2011

Manufacturer:
Bel Canto Design, Ltd.
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The equipment identified here conforms to the Directive(s) and Standard(s) specified above.

Type of Equipment: Audio Amplifier
Models: REF150S
Date: January, 2012

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